THE JOURNAL OF GEOGRAPHY

VOLUME XI MARCH, 1913 NUMBER 7

THE RHINE GORGE AND THE BOSPHORUS

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THE RHINE GORGE

THE gorge of the middle Rhine through the Slate mountains of western Germany has long been a famous path of traffic and travel. The populous and busy lowlands on the north and south are connected by active movement on roads, railroads and boats through the narrow passage cut by the river in the rolling highlands; but the highlands, which hardly deserve to be called mountains, are quiet, out of the way districts, and the gorge is rather a thoroughfare than a place to live in. A trip by train or by down-stream boat is made too quickly for full enjoyment; a boat trip upstream in pleasant summer weather is a holiday experience not to be forgotten. The river winds gracefully, so that new prospects are opened continually as one advances. The walls of the gorge, though often still so steep as to expose rock ledges, are forested in the shade, but terraced for vineyards where the slope is turned to the sun. Lateral ravines are frequently opened by small tributaries; even the smallest side streams have already cut their ravines down so deep as to join the main valley floor at grade: this point should be consciously noted and carefully remembered by travellers who propose to continue their journey to the Alps, where the side valleys "hang" over the main valley floors in the manner so significant of intense glacial erosion. The floor of the Rhine gorge is seldom more than two or three times as wide as the stream; slender flood plain scrolls are rather systematically developed with relation to the gentle meanders of the river, which is still fit to follow the curves of its valley. The flood plain scrolls are widened where the side streams try to build deltas forward; but their try is defeated by the rapid current, and the deltas are stretched out in small width along the side of the gorge.

Villages often occupy the delta strips or flood plain scrolls, and at one or another of these—St. Goar, for example—the holiday traveller should stop for a day. He will find good accommodation of the simple kind, and if he has the luck to get a front room—the third floor is not too high—in an inn that overlooks the river and the promenade of trimmed trees along the river-bank, a stop of only one day will not seem long enough. An easy stroll should be taken up one of the old zig-zag

paths through the terraced vineyards; but beware of following these paths at the time of vintage!—or along one of the newer paths opened through the woods by the local Tourist Club; thus one may reach a good lookout point on the bench a few hundred feet over the river, and here the prospect widens. The immediate enjoyment of the view is heightened if the visitor has prudently chosen a shady path for the ascent, for summer weather can be warm in Europe as well as in America.

The narrow gorge is now seen to be sharply incised in a flat-floored trough, half a mile or a mile wide; and the trough is sunk a couple of hundred feet below the upper highlands, to which an easy ascent is made on soil-covered slopes of moderate slant. If time allows a stroll on the highlands, a much more extended view may be gained, especially if one reaches the summit of a gently swelling hill. Many other similar hills are then seen; a few miles back from the trough and gorge, the hill tops broaden in gently undulating highland plains, and all the hilltops and plains unite to form a rather even highland in which the Rhine and its tributaries have incised their present courses; but their valleys disappear at a little distance and one then sees only the gently undulating highland. Occasional forest-clad ridges surmount the highland by five hundred or more feet; lookout towers rise on some of them, and paths with ingenious guide-board symbols lead up there through the trees: but for a stroll so far prolonged from a riverside village, one must choose his village and give a day to it; a repaying day, truly, for it will seem as if central Europe were spread out at one's feet when the tower-top is reached—not that it is all visible, but that Frankfort lies just beyond a ridge to the southeast, and that Cologne is beneath the horizon in the northwest, and the Hessian depression is on the other side of the eastern hills, while the western hills extend into the Ardennes between France and Belgium.

Rock outcrops are rare on the highland and their ridges; but the flanks of the ridges are rendered difficult of cultivation by blocks and scraps of quartzite, which are slowly creeping down the graded slopes; hence the ridges are forested; each one is therefore a *Wald* of some local name, such as Idarwald and Soonwald. The walls of the gorge offer plentiful chances of seeing the rocks which may be inferred to make up the highland mass; and when the steep inclination and disorder of the strata are recognized, it becomes apparent that the gently rolling summit-level of the highland represents a fairly well developed peneplain, above which the ridges are maintained as linear monadnocks by the resistance of their quartzite belts, and below which the Rhine has eroded its steep-walled gorge since the peneplain was uplifted from the former lowland altitude of its origin—or, if one wishes to adopt Philippson's explanation, since the lands along the seaward course of the primeval Rhine were submerged, so as to shorten the river and bring its mouth nearer to the Slate mountain highlands, thereby increasing its fall and compelling the incision of the gorge beneath

the peneplain surface, without any elevation of the peneplain whatever. We cannot stop here to discuss the relative merits of these two hypotheses; each one is ideally perfect, but it is difficult to determine which one is the true counterpart of the past in any given instance.

Whichever of the two hypotheses, or whatever combination of them is eventually established in this case, good indication that the river once ran at the highland level, or that the highland once lay at the river level, is found in beds of water-worn cobbles and gravels that are not infrequently disclosed in road cuts and borrow pits on the high country back from the gorge. When we descend again into the wide trough floor in which the narrow gorge is cut, it becomes clear that whatever change of altitude compelled the once contented river to cut deeper into the highland mass, the change was not single and continuous; it must have been accomplished in two phases, separated by a long pause; the first phase compelled the deepening of the trough; the pause permitted its widening; the second phase compelled the erosion of the gorge; and since then so little time has elapsed that the widening of the gorge bottom is only just begun; indeed, the gorge channel is not yet completely graded, for rock ledges interrupt it at several points, narrowing and hurrying its flow so as to embarrass navigation, although much of their mass has now been blasted out. The trough may therefore be described as a maturely widened valley of moderate depth, that was eroded before the young gorge was incised in its floor. If confirmation of the erosional origin of the trough is wanted, it may be found in the water-worn shingle and fine textured, stratified alluvium with which the truncated slates of the trough floor are covered. It may require careful and persevering search to find a section in a ravine where these significant deposits are laid bare; but they can be found—nineteen years ago there was a good exposure in a little branch ravine in the trough floor just north of the village of Bacharach—and the finding repays the search.

Another thing is worth searching for: that is, a point where the present gorge lies at one side of the trough, so that one wall of the gorge there rises directly to the highland surface, but with a round-shouldered curve at its top. From the higher slope of such a wall, all the elements of the district may be comprised and comprehended in a single view. The highland stretches away east and west, with cultivated fields on its rolling hills, and compact villages here and there occupied by a quiet, rural population. One or more of the uninhabitated quartzite ridges, or linear monadnocks, may rise in the distance over the highland. The trough floor, or old river bench, is well displayed: it is carefully cultivated, for its soil, an ancient river flood-plain, is fertile: it is often so sharply cut by the gorge that one may walk close along its edge and look down to the river. It is usually on the projecting corners of the bench, or at an angle where it is cut by a

side ravine, that the famous castles of the Rhine were built; many of them are now in ruins; others are repaired and occupied, often enough by quite other families than those of the "robber barons" who built them: an American flag has been seen flying over the tower of at least one of these ancient strongholds.

The steep walls of the main gorge, tree-covered or terraced and cultivated according to their aspect to the sun, descend to the river or its narrow flood plains; and the swinging river, curving into and out of sight, sweeps by on its way to the sea. Villages on the delta-strips by ravine mouths, hurrying passenger trains on both sides of the river, swift passenger boats in its winding channel, slower freight trains and puffing towboats with strings of heavily laden barges are all in full sight. Unhappily the smoke from the boats hangs too often and too long in the gorge, and dulls the farther view. It is not a simple matter to steer the barges around some of the river turns, especially near the Lorelei, where hard-rock ledges still beset the channel: a flagman is stationed on the bank at the turn, to warn a tow, slowly advancing upstream, of the approach of the faster downstream boats. For a time in the last century, the towboats dragged themselves upstream by means of a wire rope that was laid along the river bed; but after each flood the rope was found deeply imbedded in the bottom deposits, although the bottom was not built up—thus showing that during the flood the river had been deepened by temporarily lifting the bottom deposits, as well as by the rise of its surface. What with the labor of resurrecting the rope and the improvement of the towboat engines, dragging is now given up; and enormous volume of freight, said to be much greater than the combined tonnage of the two railroads, is now carried in barges. One must go many miles east or west, to find any other line of movement so well favored by nature and so actively used by man.

CITIES OF THE RHINE VALLEY

It is perhaps hardly necessary to remind geographical readers that the Rhine flows to the northwest; but as the outdoor sense of direction is poorly developed in many travellers, and not always well developed even in school teachers—dare I say, it is especially weak in "schoolmarms"?—it is well to take heed of the river current when one describes a journey as "up" or "down" the Rhine. More than one summer tourist in Europe has told of going "down the Rhine," because the route of travel ran "down the guidebook map." Bingen lies on the left bank of the river at the entrance to the gorge, and hence at the northern end of the broad Rhine trough which begins 160 miles farther south at Basel on the border of Switzerland. On the shoulder of the highland opposite Bingen, rises the superb monument built by Germany to celebrate the victorious war against France in 1870-71; it is reached by an inclined railroad and deserves a visit for itself, as well as for a walk over the wooded hills back of it. Mainz lies a little farther up

the Rhine (southeast), where the Main comes in from the east, and Frankfort is a little way up the Main. The modern improvement of the river channel and of the power of towboats has greatly favored the commercial development of these cities as well as that of Mannheim, farther south.

Bonn lies on the left bank at the lower end of the gorge 70 miles below Bingen: the highlands there are not so high as near their southern margin, and the gorge is therefore less deep. Cologne, as we write it following the French fashion, or Coeln, as the Germans write it, lies also on the left bank 17 miles farther down stream in an open country: the name as well as the street pattern in the central, older part of this ancient city, is retained from Colonia of the Romans. Coblentz marks the confluence of the Mosel about midway in the gorge; and Coblentz is nothing more than the Latin Confluentia, modernized. A side excursion up the Mosel to Trier, quickly reached by rail, will show that its gorge is much more meandering than that of the Rhine, and a stop at Trarbach long enough to walk up the bordering hills will show that the Mosel gorge, like the Rhine gorge, is cut beneath a flat trough floor; hence the two-phase movement and the deliberate pause between the two phases has more than a local application. The Lahn comes in from the east nearly opposite the Mosel from the west, and Ems lies in the Lahn valley not far from its mouth.

The Rhine and its two chief tributaries of this district, the Mosel and the Lahn, divide the highland into unequal quarters. The southeastern quarter is the Hunsruck, which also has other surmounting ridges, with large spurs between its occasional ravines, all forest clad; Wiesbaden, celebrated for its "waters," lies at its southern base. The southwestern quarter may take its name from the Hunsruck, another surmounting ridge, not so heavy featured as the Taunus; its uplands are worth visiting, if only to see the contrast between their quiet fields and villages, and the throbbing artery of the Rhine. The northwestern quarter is the Eifel, noted for its volcanic features; it extends westward and becomes confluent with the Ardennes. The northeastern is the Westerwald, which gradually falls off to the north. The relief is nowhere strong, and over most of the area the forms are subdued and softened by long continued weathering. Precipitous slopes are found only in and near the gorges of the larger rivers.

THE BOSPHORUS

Now imagine a similar highland, perhaps a little less rolling than that of the Slate mountains; place upon it some irregularly sprawling—instead of linear and parallel—monadnocks; let a transverse river, flowing from northeast to southwest, cut a deep and somewhat sinuous gorge through it in one effort; that is, let the river be compelled to cut down its gorge without any pause, such as that which permitted the mature widening of the mid-height trough floor by the Rhine and the Mosel: then let a depression of the region take place, whereby the gorge is submerged to half

its depth, and the river is transformed into a strait, 17 miles in length, connecting a large water body on the north with a small one on the south: this strait is the Bosphorus, connecting the Black Sea and the sea of Marmora.

The submergence of the gorge and its transformation into a strait was first suggested by Philippson. It must be conceived as of so recent a date that the small waves of its sluggish waters have not yet made a significant bench along the two shore lines; and that the side streams have not yet had time to fill the embayments, occupying the half-drowned lateral ravines, with deltas. One of the embayments that heads up to the northwest and joins the strait near its southern end, is called the Golden Horn: Constantinople occupies the slopes on both sides of it, and its shores are landing places for many vessels. The great city, as well as many villages on both sides of the Bosphorus, occupy the slopes to the water's edge, and the water is so deep close to the shore that passing vessels sometimes collide with the houses. At the time of my visit in the spring of 1903, a house had had one of its corners torn out by an intruding bowsprit. Robert College has a beautiful situation on the edge of the uplands a few miles north of Constantinople: it commands a superb view of the Bosphorus, of the slopes on the opposite side, and of the uplands and their monadnocks in Asia Minor. There are no railroads along the shores, but many vessels pass to and from the Black Sea; hence, like the gorge of the Rhine, the half-drowned gorge of the Bosphorus is and has long been an important line of traffic and travel: it has no rivals for scores of hundreds of miles east or west.

The Bosphorus has a slow surface current setting southward from the Black sea whereby the inflow of the Danube and the rivers of southern Russia is discharged to the Mediterranean. The waters of the Black sea are brackish; those of the Mediterranean are more salt than the ocean: hence there is a very slow undercurrent of denser water constantly creeping along the bottom of the strait to the Black Sea. The captain of a British vessel undertook to measure the velocity of the under-current by letting down a loaded box by a cord and attaching the cord to a floating buoy: the buoy was slowly dragged northward, against the surface current; whereupon the Turkish boatmen said it was dragged by devils. That view of the case goes well with the rust on the neglected warships, anchored in the Golden Horn.

TURKEY AND THE TURKS

Constantinople occupies one of the noblest sites in the world. Travellers are accustomed to complain of the dishonesty and venality of Turkish officials; but can their venality possibly equal that of the police in New York City? The Young Turkish party, wishing to reform ancient abuses, finds

progress difficult; but is it slower than our correction of protected privileges? The story goes that the assassination of a European monarch is announced in the papers of Constantinople only as a natural death, as if the Sultan did not wish his people to become familiar with the idea that the murder of a ruler is possible; but is this perversion of news any worse than that to which we are repeatedly subjected during political campaigns? The Turks are often condemned for being Moslems instead of Christians; but is our nominal Christianity, as actually practiced, so lofty a religion that we have a right to scorn those whose actual practice comes nearer to their lower preaching? There are, however, two features of Turkish religion and life which are so much lower than the corresponding features with us, that for one, I should not regret seeing the Turks lose more than Adrianople as the result of the present war: these are the position of women and the range of education: both are so low that almost any change would be a betterment.

There are some countries where the search for truth is not hampered by any prescribed beliefs; where truth, as it is discovered, is transmitted through educational institutions, as far as it can be understood, from the highest to the lowest; and where the opportunity for education is so generously opened that everyone may enjoy it according to his ability, from the lowest to the highest. And in these same countries, it is not only one-half of the population that has this opportunity, but both halves. To be sure, even in those advanced countries, one half of the people is politically still subject to the other half; but as the religious and educational emancipation of the subject half has now been reached, their political emancipation must follow. In all these respects, the Turks are a backward people. It is not only the Bosphorus that is half submerged; nor is it, in Germany, only the highlands of the Slate mountains that have enjoyed a double uplift.

James A. Barr of San Francisco, Secretary of the California Teachers' Association and Manager of the *Sierra Educational News*, has been appointed Manager of the Bureau of Conventions and Societies of the Panama-Pacific International Exposition.

One of the great features of the Exposition to be held in San Francisco in 1915 will be its Congresses, Learned Societies and Conventions.

The many exhibits of such departments as Education and Local Economy will be used as working laboratories in 1915 by societies concerned in education, social betterment and the public welfare. Such a consideration of exhibits with the programs will be a marked feature of exposition activities.

SYDNEY HARBOR

By GEORGE L. COLLIE,

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LOCATION.—Next to Buenos Aires, Sydney, Australia, is the greatest port in the southern hemisphere. It is located on Port Jackson, a large, irregular estuary formed by the drowning of the lower reaches of the Parramatta river and several of its tributaries. Although located well to the southeast of the island continent, it is the most central and accessible harbor for commerce in the Pacific and with Europe via Cape Horn. Sydney is the capital of New South Wales, the oldest and perhaps the richest of the Australian states in mineral, pastoral and agricultural wealth. Favored as it is by a central position, a splendid natural harbor and a good hinterland it is destined to be a great port. Sydney bears much the same relation to Australia that New York does to the United States and it will long continue to be the New York of Australasia.

Importance of the Port.—Australia has an area slightly greater than that of the United States, proper. Though of great size it is an undeveloped region and thinly peopled, about one-sixth of the total population is found in the city of Sydney alone, with its 700,000 inhabitants. Australia is a large producer of wool, grain, livestock and fruit; on account of its antipodal position these products are ready for the market during the winter season in the northern hemisphere, a time when they bring the highest prices and when there is the most active demand for them. As a result of these conditions Sydney has grown up rapidly as a center whence these products are shipped to all parts of the world. In proportion to its population the foreign trade of Australia is as large if not larger than that of any other country on the globe. It follows from the circumstances cited above that the importance of Sydney as a port is out of all proportion to the population which it serves. It is perhaps one of the anomalies of commerce that a remote port in a thinly populated, semi-arid continent should be one of the commercial centers of the world. Its food and other products appearing at a time of scarcity in other regions, however, tells the whole story. Sydney Heads, the name applied to the lofty sandstone cliffs, which form the entrance to Port Jackson, are the commercial gateway of the south seas. All vessels engaged in trade in the Pacific, south of the equator, go or come via this portal, sooner or later.

Characteristics of the Harbor.—By many Sydney harbor is regarded as the finest one in the world. There is no such grandeur of scenery as delights the eye at Rio de Janeiro, Capetown or Hong Kong, but for pleasing

beauty, great capacity and utter safety, it has no rivals. There are two general aspects from which a harbor may well be viewed, one is that of the tourist, the other, and more important, is that of the sea captain. The tourist sees a rather narrow irregular bay spread out before him as he enters Port Jackson. There are 200 miles of indented shore line; picturesque headlands, bays, coves, inlets, succeed one another, there is a continually changing panorama as one sails up the harbor; new vistas are revealed, and new combinations of land and water, all of entrancing interest and beauty. On the one hand lies the attractive city of Sydney, on the other, the north shore suburbs trailing on one after the other up the harbor as far as the eye can reach. From the sea captain's standpoint the harbor is almost flawless; there is secure anchorage, free from the dreaded ground swells, than which nothing is more dreaded by ship-masters. The entrance is free from such dangers as bars and reefs; Sydney Heads are about five thousand feet apart and provide a broad free entrance. The depth of the water at the entrance ranges from 72 to 108 feet at low water, twice the depth demanded by modern shipping; in addition there is good depth of water in many portions of the harbor. It is said that vessels could run up to the shore and tie to trees in some of the deeper coves. The lofty hills which surround the harbor shelter it from all winds, so that heavy or high seas are never experienced in the port.

Port Jackson is characterized by the great number of small bays, which indent the mainland on either side, several of these coves have been improved and made available for shipping, by building stone quays, pile wharves, warehouses and cargo-sheds. The principal bays thus improved are Woolloomooloo bay, Sydney cove and Darling harbor. The most central and important of the wharves is Circular quay, 1300 feet long, which lies at the head of Sydney cove. All of the great mail liners have their berths here; all the trans-harbor life represented by the great ferry system, centers here, the tram car lines of the city focus at this point; it is the Battery of Sydney, the busiest center of the city and of Australia. The great freight wharves are in Woolloomooloo bay and Darling harbor, the latter the more important center. Further up the harbor along the Parramatta river there are many water front improvements under way, these are carried out chiefly by lumbering companies; there are also timber companies, brick and tile works and the like operated by the state instead of private owners, there is a marked tendency in this direction in Australia.

Harbor Facilities.—Nearly eight miles of the two hundred miles of shore is lined with wharves; there are about thirty acres of covered wharves forming the so-called cargo sheds; over 9000 feet of wharves are connected with railway lines. There is an abundance of cranes, conveyors, electric lights and large storage warehouses; in the harbor are located 4 graving docks, 5 floating docks, 3 patent slips, 233 lighters, 58 ferry boats, 39 tugs,

numerous launches all licensed and governed by the Harbor Board. This equipment affords every facility for loading and unloading vessels, and where necessary, of repairing and refitting them. The harbor is well supplied with channel and range lights; at the entrance on South Sydney Head is one of the most powerful lights in the world, supplied with oil, gas and electricity, so that if one source of light fails, another may be supplied instantly; under favorable circumstances this light may be seen forty miles at sea.

The harbor is administered by a board known as the Harbor Trust Commission, which manages the port for the state. This commission has plenary and even arbitrary powers; it practically exercises the powers of an owner in all that pertains to the harbor. The commission is composed of enterprising and farsighted men, who are doing much to improve and modernize the harbor. They exercise the right to condemn any property they choose, both water front and land lying behind it, for wharf or warehouse purposes. They condemn land and hold it for a term of years, in the meantime allowing it to be used for children's playgrounds, public school or other purposes.

The most important commodity shipped from Sydney is wool; that city is the greatest market in the world for merino wool and it is rapidly supplanting London as the wool market of the world. Buyers in ever increasing numbers are going to Sydney instead of London to purchase wool The zeal of the harbor commission in conjunction with that of the business men of Sydney is nowhere better shown than in the splendid facilities they have provided for storing, baling, and shipping this commodity. Large warehouses five and six stories high have been built and fitted with the most modern appliances for handling wool. About 850,000 bales pass through the Sydney market annually; some of the larger warehouses have a floor space covering five or six acres and capable of holding 50,000 bales at one time. Usually the first floor is a sample floor, while one or two upper floors are used for baling (locally termed "Dumping the wool.") and binding the bales with steel hoops; other floors are used for weighing and storing the product. Powerful compressors operated by electricity are used for baling; they reduce the size of the bales, as they come in from the sheep farms, from about 23 cubic feet to 16 cubic feet, each bale weighing about 400 pounds. The warehouses are located near the wharves and great steel chutes lead from the storage rooms down to the cargo sheds. The bales are shot down the chutes by gravity to the wharf, whence they are transferred immediately to the holds of the waiting steamers.

Another great and unique industry of Australasia, and one which is conducted on a large scale at Sydney, is that of freezing and chilling meat for export. Great quantities of sheep, cattle, and rabbits are frozen in great refrigerating works and then sent by refrigerator steamers to Europe

and America, where the meat arrives in as good condition as the day it was shipped. Over two million carcasses of sheep and lambs are exported in this form annually from Australia alone.

A large number of steamers are required to transport the commerce originating in Sydney; the companies which own these steamships may be divided into several groups, according to the destination of the traffic. These groups are as follows: 1. The ferry companies, which maintain communication with various parts of the harbor. 2. The coastal companies, which are engaged in trade up and down the coast. 3. The interstate companies, which carry on trade with other Australian states. 4. The intercolonial companies, which do business with New Zealand, Tasmania, and other colonies of Great Britain in the Pacific region. 5. The oversea companies, which trade with remoter regions; under this head are included such important steamship corporations as Burns, Philp & Co., Houlder Bros., Huddart, Parker & Co., German Australian Steamship Co., Messageries Maritimes, Nippon Yusen Kaisha, North German Lloyd, Oceanic Steamship Co., Orient Royal Mail Line, P. & O. Co. (Peninsular and Oriental), Union Steamship Co., and others.

SOME PHASES OF THE NEW GEOGRAPHY

By CLEMENT L. MARTZOLFF,

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THE article on "Robinson Crusoe, a Study in the New Geography" having called forth two very excellent contributions to your columns leads the writer to again "try his hand."

The purpose, as will be remembered in the former sketch, was to show how Robinson Crusoe epitomized the human race in its struggle with environment; and that there is no such thing as geography where man has not gone. Rivers may plow their way to the sea and mountains may be covered with forests, but if man is not there to utilize them, there can be no geography in the restricted sense of the word. Neither is there geography where man is and he makes no effort to conquer his natural environs; where, instead of his being the Master and Nature the servant, Nature is the Master and he a slave.

The degree of a civilization is determined by the capacity of a people to utilize the forces of Nature. Therefore the two great general subjects of geography are Nature on the one hand with its influences and Man on the other in his responses. Mr. Sutherland, in his splendid book, *The Teaching of Geography,* calls the same idea "controls and responses."

Since we are, in a great measure, what skies and mountains and rivers have made us, and since civilization is determined by what we make of these same skies and mountains and rivers, it is plain that there is a continuous series of actions and reactions and counter-actions and counter-reactions between Nature and Man. *It is this we study in geography;* not Nature alone; not Man alone; but their inter-relationship. Then why not this definition of the "New Geography?"—*The study of the inter-action between Nature and Man.*

The poet, even, has told us how Nature speaks to us "in a various language." Man, from his primitive state to his present condition of enlightenment; and man, wherever he lives today, whatever may be his stage of civilization or non-civilization, has read and is reading these "manuscripts of God" and is placing his own interpretation upon them. Nature speaks to all men the same, but men do not interpret alike. The character of the interpretation determines the character of Man's re-action and response to the forces and controls of the natural world.

As Nature in her various forms is to be the constant factor in determining Man's environment, it follows that a true understanding of the new geography can be ascertained only by knowing what these "expressions" or forms are.

First, she places Man somewhere on the surface of the earth; it may be under the direct rays of the sun, as at the equator, or the oblique shafts of light near the polar circles, or the alternate declinations between the extremes. It may thus be where the seasonal differences are more nearly uniform, or decidedly abrupt; where the light and darkness is constantly equal or perpetually unequal. The writer prefers not to call this condition of Man's environment "climate." While it might well be thus classified, yet this influence is so general in its cause, and control, due to the inclination of the earth's axis and the revolution of the earth about the sun, that the indefinite term "position" might well be applied.

Having selected a region in which Man is to live, a definite garden for him to dress and to keep, Nature comes closer and speaks in tones more distinct. Man stops and listens and this is what he hears. It is the voice of rock and soil; of mountain and plain and valley; of river and lake and sea. What shall we call this "expression?" Perhaps Dr. Dryer, since he makes two divisions of these same forms, would call it the "Pedo-hydrographic." But if we restrict the meaning of the much used and much abused term *physiography,* it may well be applied in this classification.

Again Nature seeks expression. This time it is found in the winds, the rainfall, in short, *climate.*

Then because of position, of the character of earth forms, of the climatic condition of a region, another expression is found. This is *plant* life.

A fifth and last control, the resultant of the four preceding it, is seen in the various phases of *animal* life. These all constitute legitimate subject matter in the study of geography. But to study them alone is not to study geography. When we study the first one, it is astronomy; the second is a near approach to geology; the third is meteorology; the fourth, botany, and the fifth, zoology. They are *sciences.* Geography thus becomes the meeting place of all the sciences. The better a person understands these subjects, the better ought to be his understanding of geography.

Now, as to the second element in the New Geography. If Nature is the constant factor, then Man is the *variable.* Men do not interpret alike. The character of his interpretation finds expression in certain rudimentary and fundamental, persistent characteristics called *institutions.* The first of these of course is the *industrial.* The desire for food and protection for the body is elemental. In the morning of the world the divine fiat went forth for man to "earn his bread by the sweat of his face." To get a living, to wrest from the earth its fruits, becomes at once the predominating fact in geography. Out of this very desire for the creature-comforts has developed other institutions. For man cannot live to himself alone. He has a deeper interest in his offspring than in any other human beings. He shares the fruits of his labors with these and so comes to establish the *family*—or the *social institution.*

This very idea—the altruistic—leads him a step farther and he recognizes that if he can get the help of his neighbor he can the more easily contend with the forces of Nature and increase the yield, that he and his family may enjoy more of the riches of the earth. He solicits help which brings him face to face with the proposition that if he is aided, he must return that aid. He enters at once into reciprocal relations with his fellow-men. Out of this need has come the third institution, the *political.*

Science has driven out fear, but primitive man was unscientific. He saw the moods of Nature, but he did not understand them. Many of the most common of the natural phenomena he looked upon as enemies—the dark forest where lurked his foes, the avalanche, the lightning's crash, and the devastating flood, which might destroy the works of his hand. On the other side were the gentle winds that blew the vegetation into life, the refreshing showers, the fountains of water, all aiding him in his great desire. Not understanding these manifestations, he attributed them to the moods of superior beings, who might be either requited or appeased. So he builded him an altar and offered sacrifice. And he had established another institution—the *religious.*

These would be all the institutions man would require if he did not possess an interest in his posterity. In order that the son might not be

compelled to begin where the father began and learn his lessons by experience; in order that the fruits of one generation might be enjoyed by another; in short, that the first four institutions which Man established might be perpetuated, he has endowed a fifth and last—the *educational.* The story of how man has developed these five institutions in accord with his responses to his natural environment, is what we call history. The account of how he today is conforming these institutions is a part of the province of geography.

If man could have "lived by bread alone," he would have been, then and now, satisfied when he had expressed himself in institutions. But his achievements were too great for him to remain silent. His contests and conflicts were too many and his glories too grand not to recount them. He sought another avenue of expression. It was to be devoted to the beauty in nature, the sublime, the *Aesthetic.*

So he tells the story in figures of speech and has a *literature.* At first it is crudely done in the form of *myth* and *legend;* then he places it in verse, and we call it *poetry.* Someone rounds it out in periods and *oratory* is born. That many may unite in telling the story, and to make it more real in the telling, it is divided into parts and acted, and we have the *drama.* The dreamer takes the threads of myth and poetry and oratory and drama for his warp and weaves into the fabric the rich tapestry of his imagination, a story that has never taken place, but is ever occurring. We name such a creation *fiction.*

But literature is not the only type of Man's *aesthetic expression.* For he takes his poetry, places it upon a staff and he sings it. Now it is, "when the lotus has lost its healing and the spring of Lethe can no longer be found, *music* is born." Again, he takes the chisel and hammer and the rough block of marble springs into being. Or perhaps he dips his brush into the pigment and spreads it across a canvas which breathes and pulsates with the throbs of life. Or, finally, with knife and saw, he projects column and capital, cornice and arch, balustrade and portico, cupola and tower, minaret, spire and dome. Some one has called architecture "frozen music." The expression of the aesthetic is *art.*

To the readers of the *Journal* it demands neither illustration nor argument to establish the fact, that since man's *institutions,* his history, are determined by his natural environment, and since his art is in praise of his institutions, then the latter must of necessity breathe the spirit of the abounding sea, sky, forest, lake and river. What a wonderful field is covered by this geography. All man has wrought and thought and felt is levied upon, making it the richest of all studies.

What this brief sketch has purported to show may be more clearly seen in the following outline:

GEOGRAPHY

The study of the inter-action between

I NATURE	and	II MAN		III
1. Expressions		1. Expressions		1. Literature
Position		a. Institutional		Myth and Legend
Physiography		Industrial		Poetry
Climate		Social		Oratory
Plants		Political		Drama
Animals		Religious		Fiction
—Science		Educational		2. Music
		b. Aesthetic		3. Sculpture
		—History		4. Painting
				5. Architecture
				—Art

PROBLEMS IN THE STUDY OF CLIMATES

By ROBERT M. BROWN,

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THE general idea of different climates is not new to the pupils when they undertake the study of the continents. The supplementary reading and the stories which are used as an introduction to the world as a whole should have given to the pupils certain definite notions concerning the physical features of a few selected areas. For example, the stories of the "Seven Little Sisters," if they are told as geographic material and are properly illustrated with a globe, will furnish a crude zonal classification of the earth.

This idea of climates together with the experiences and records of the weather features at home is the basis upon which the pupils build to gain a knowledge of the climates of distant places. Following upon knowledge and valuable as a review and also as an exercise which will test the ability of the pupils, a number of problems are easily formulated. This paper offers a brief syllabus upon one.

PRELIMINARY DISCUSSION OR PREPARATION

A. The child ought to have learned from stories that in the north it is cold all the year, along the equator, warm all the year and in the areas between it is cold part of the year and warm part of the year. This is the zone idea and in the main it opens to the pupil the first control of the climates of the earth. As one goes away from the equator, a colder and

colder climate is experienced. *Distance from the equator then is the first factor of the problem.*

B. The child has probably studied in story form the life on the world's great highlands and lowlands. Possibly a mountain lies within view of the neighborhood and the early and late snow cover has been observed. From reports and pictures of mountains, from the use of mountain areas as summer resorts and from the stories of men in airships and balloons the fact is further emphasized that as higher levels are attained the climate becomes proportionately cooler and at high levels a zone is reached where it is cold all of the time. *Height above the sea level is the second factor of the problem.*

C. The seashore is a cooler place in summer and a warmer place in winter than inland. The phrase, smaller annual range of temperature, is a convenient one to use for this. The knowledge of this condition may be obtained from experience, from reports of snow cover or from the use of seashore places as both summer and winter resorts. Experience cannot be relied on except in a very few cases; the great majority of the pupils are not travellers. Reports of experiences are more common. It is commonly a topic of conversation in many places, as for instance Worcester, that while snow fell in the home city, in a neighboring city on the sea coast, as Boston, the precipitation fell as rain. Thus we may arrive at the conclusion that the proximity to the sea tends to moderate the extremes of climate and yields a much smaller range of temperature for the year than is the case in the inland locality. *Distance from the sea is the third factor in the problem.*

D. The study of winds on the calendar has taught that north winds are cool, south winds are warm, east winds are stormy and west winds bring fair weather. Winds, therefore, from a warmer area will raise the temperature of a place and winds from a cooler area will lower the temperature. Already the inference has been made that the ocean is cooler in the summer than the land and warmer in winter. Therefore winds from the water will be cooler in summer and warmer in winter than the winds from the interior so that a climate so controlled will have a less annual range than one controlled by winds from the land. Direction of wind, especially direction in reference to land and water bodies, must be known, so that as fast as the countries are studied the knowledge of the planetary wind belts is an essential. *Wind direction is the fourth factor of the problem.*

E. It is a point for observation in any location that during the summer the temperature is lowered by precipitation while during the winter the temperature is higher during a storm than the average for the season. From experiencing the warming tendency of a snow storm has arisen the common saying that it is too cold to snow. Countries which are rainy, then, must have a less range of temperature than the average for the latitude.

A subsidiary problem is possible at this stage. The rainfall map of the countries to be studied may be approached from the discussion of the general causes of rainfall. Briefly, the line of reasoning includes (a) the sea as the great source of rainfall, so that coast areas have a greater precipitation than interiors of continents, (b) windward coasts will have more rain than leeward coasts, (c) moisture is precipitated from the air after sufficient cooling, as can be illustrated by the precipitation on a window pane or an ice pitcher, (d) ascending air, carrying moisture, cools and will therefore yield rain, and (e) ascending air is caused by heat as is shown by a lamp or by air being forced up a slope. Therefore in areas which are heated, as the equatorial belt, and on windward side of mountains, rain may be expected, while conversely where air is descending, as within the tropical belts of calms and on the leeward sides of mountains, a lack of rainfall will be the experience. After a careful consideration of these points and with the topography and wind belts as a part of the equipment, the pupils should be able to construct a rain map of any area. *Rain is the fifth factor of the problem.*

F. A few correlative statements which bring together certain factors which act in unison may now be considered if more accuracy is desirable at any stage in the process. The combined effects of height and latitude, of height and rainfall, latitude and rainfall, wind direction and nearness to sea, and slope, whether sun-facing or not, and latitude may be introduced.

After this preliminary review of the controls of climate in order to collect the data which have been spread over a considerable space of time, the application of this knowledge forms the problem. In discussing climates, rather than to learn the empirical statements of the conditions experienced at the various areas, it is better to compare the climates of these places with the home area. This can be done much more definitely than is ordinarily practiced. Thus, a brief statement of the home climate is made.

Worcester. Temperature ranges roughly from 95 degrees in summer to 0 degrees in winter.
Rainfall is moderate; 40 inches per year evenly distributed through the year.

Statement of Controls.
Worcester is in latitude 42 degrees north; 500 feet above sea level; 50 miles from the sea; winds are westerlies and from the land.

PROBLEM—What is the climate of Portland, Oregon?

1. Portland is in 45 degrees north. This is 3 degrees farther north than Worcester which would make the climate slightly cooler.

2. Portland is about the same height above sea level as Worcester. This factor is the same in both places.

3. Portland is about the same distance from the sea as Worcester. This factor will cause no difference in the climates.

4. The winds at Portland are west winds from the water so that the summer temperature will be moderated and the winter cold will be tempered. The range will be less than that in Worcester.

5. Portland has more rain than Worcester and for this reason again the temperature will have a less range than at Worcester.
Conclusion. The climate of Portland will be one of considerably less range of temperature than Worcester's and the average may be slightly cooler.

PROBLEM. What is the climate of Irkutsk?

1. Irkutsk is in latitude 52 degrees north, and is therefore colder than Worcester.

2. Irkutsk is 1500 feet above sea level; colder than Worcester.

3. The city is far inland and will have therefore greater range of temperatures than Worcester.

4. The winds are westerlies from over the land. This is somewhat similar to the Worcester condition.

5. Irkutsk has a much smaller rainfall than Worcester.
Conclusion. The city has a larger range in temperature than the home city, the average temperature is somewhat lower, due to its northern position with a rainfall of between 10 and 20 inches per year.

In taking a city not situated in the middle belt, which is the area of warm summers and cold winters, the comparison must be taken in terms of the general climatic influence. Thus the tropical belt is given as warm all the year and consequently the range of temperature which is an important item in the middle belt must be considered as beginning at the zero mark in the center of the belt and increasing with increasing distances from the equator.

The writer realizes the defects of the method but for the pupils in the upper grades of the grammar schools the plan has been found to increase the interest and zeal for the subject of climates. In every case when the climates have been worked out in this way, an authoritative statement of the climate of the locality should be given in order to note and correct divergences.

THE WORLD CARRIERS AND THE PANAMA CANAL*

By J. RUSSELL SMITH,

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World commerce has a world mesh of trade routes. It also has world carriers in fleets of tramp steamships standing ready to go anywhere that ships can sail, and to pass from route to route as wagons pass from street to street. It also has world carriers in steamship companies whose services overreach any trade route and render astonishing feats in connecting a commercial community to its world environment.

While we have long since learned to think of railroads as systems, we are still prone to think of steamship lines as doing what the early railroads did—merely connecting two places. This idea must be discarded. The law of growth among steamship lines works surely to the development of trunks and branches, a development which has already taken place, although the branches are fewer than upon railroads. The improvement of the steamer and the use of the ocean cable gave the needed regularity, dependableness, and knowledge for the organization of ocean commerce and transportation into a regular and systematic service akin to that of the railroad. The great ocean lines sail with precision and regularity. To secure the supply of freight for these great lines, their managers have been compelled to establish smaller lines to supply and distribute the necessary cargo. The largest trans-Atlantic lines are, without exception, thus equipped at one or both of their termini. The North German Lloyd and the Hamburg-American connect at their European ends with lines running to South America, east Asia, and other distant parts of the world. They also connect with smaller lines plying to the near-by European ports and with steamers on the German rivers. These two German companies carry the same system even farther. Their trunk lines to east Asia are fed at Singapore and other eastern ports by lines of smaller German steamers which traverse the eastern archipelagoes and the Asiatic coasts and rivers, collecting cargo for the trunk line stations of the large steamers bound for Bremen or Hamburg, at which ports it is distributed by the European distributors referred to above or sent on to America by the trans-Atlantic lines. The Wilson Line from New York to Hull connects in that city with an enormous fleet of small steamers which thread the coast of the North Sea and reach all ports of importance in Scandinavia and along the Baltic. Some of the other British trans-Atlantic lines connect with British coasting lines and with the lines to Australia and other British colonies. The French

*This article will later appear as a chapter in a forth-coming book on *Commercial and Industrial Geography* by Professor Smith (Holt).

and Italian trans-Atlantic lines are fed by fleets of Mediterranean coasters and trans-oceanic liners at Havre, Marseilles, and Genoa. The Cunard Line, giving a service from New York to Liverpool and from New York to southern Italy and Fiume, Austria, has a line connecting Liverpool and Fiume. These steamers call at more than twenty ports and gather freight which is to be transferred at the ends of the route to the next steamer bound for America. Other examples of this systematic trunk and feeder development of ocean service might be mentioned; but they would show no feature differing from the development of the examples cited or from the railroad and its branches except that the ocean service of single companies at times circumnavigates the globe and covers a much wider scope of territory than any railroad system in the world can ever serve.

The company that runs a line on one route only is at the mercy of any local fluctuation in traffic. A strike even might spoil the profits of a quarter; so might a drought or any local uncontrollable disturbance. Then, too, there are seasons in nearly all trades during which the traffic is abundant and others in which it is scarce. Just after harvest time, wheat, corn, and cotton go forward in quantity and the trade falls away to small proportions as the next harvest approaches. The steamship company with many lines can have its annual work evened up by seasonal prosperity in one quarter as dullness comes in another. Instead of having ships half idle on its one dull route, it can shift them to the prosperous route. As the vessels get old and antiquated for the finer routes they can be shifted to a slower and inferior route. The greatest advantage, however, is the picking up of freight for the main lines, just as the branch roads feed a main trunk railroad.

All these forces are welding the ocean carriers into ever-growing systems.

The best example of a wide-reaching world carrier is furnished by the Hamburg-American Steamship Company. This one company dominates the metropolitan city of Hamburg and connects it with Montreal, Portland, Boston, New York, Philadelphia, Baltimore, Newport News, New Orleans, and Galveston in the eastern United States. It sends steamers to Mexico, Central America, Panama, Colombia, Venezuela, and several services to the Lesser and Greater Antilles. They go to the Amazon, to the ports of central and south Brazil, to Uruguay and Argentine Republic, to Chile and Peru and on up the Pacific coast of America to ports of the United States. In Europe they circumnavigate the British Isles, skirt the coast of France, Spain, Portugal, and Italy, to the head of the Adriatic; they go in the Baltic to Russia and Finland and Sweden, and out in the Atlantic to Iceland and North Cape, and on to Arctic Spitzbergen in the summer. In Africa it touches at Alexandria and down the whole west coast as far as the mouth

of the Congo. In Asia it serves Aden, the ports of Arabia, Persian Gulf, Ceylon, Calcutta, Straits Settlements, China, Korea, Siberia, Japan, and finally—and possibly most remarkable of all—it sends steamers thence across the Pacific to Portland, Oregon—a grand total of sixty-eight services crossing every ocean, touching all continents and every geographic and commercial zone. Extensions are in contemplation or contracted for. Recently the news comes of the formation of a larger and yet more comprehensive group of British lines formed by the union of the Cunard Company with other companies serving practically all important parts of the world.

Equally suggestive and almost equally far reaching is the joint organization of railroad and steamship lines. This practice, common in America, Europe, and Asia probably reaches its highest development in the Canadian Pacific Railway which operates in connection with its trans-continental railway line a trans-Atlantic service to Europe and a trans-Pacific service to Japan, China and Hong Kong. It also has a steamer line on the American Great Lakes.

THE PANAMA CANAL

Into this complex maze of world routes served by world carriers comes a new factor, the Panama Canal. This waterway will add to or take from everyone of the great ocean trunk routes. The north Atlantic, the Mediterranean Asiatic, the Good Hope, the South American, the north Pacific and the Pacific Coast (North American) Australasian. There is no continent, almost no important country even, that will not find a rearrangement in the route by which its goods go and come by sea. To their great relief, steamship lines by the score will rearrange their itineraries, and the tramp freighters by hundreds and thousands will find themselves unloosed from harassing restrictions and free to work their way around the world with a freedom that will redound to the benefit of hundreds of millions of men. The start forward to this, the greatest readjustment of all time, is not unlike the general movement that follows the signal of a policeman in a crowded street when he releases two masses of waiting men or vehicles after a parade has passed.

The possible freight for the Panama Canal lies in four main zones; Pacific North America, Pacific South America, Australasia, and East Asia. Excepting the first, all of these are marginal traffic, traffic that can seek an alternative route. The great question is—What does it cost the ship to go around? To the time charterer the cost of ships in the market enables him to tell to a nicety what they cost—and this cost varies with freight rates, and they fluctuate through hundreds of per cents.

Savings by the Panama Canal

	Nautical miles	Days at 10 knots	Days at 16 knots
Liverpool to Port Townsend	5,666	23.1	14.2
Liverpool to San Francisco	5,666	23.1	14.2
Liverpool to Honolulu	4,403	17.8	10.9
Liverpool to Valparaiso	1,540	5.9	3.5
Liverpool to Yokohama	-694	-2.4	-1.3
Liverpool to Shanghai	-2,776	-11.	-6.8
Liverpool to Sydney	-150	-.6	-.4
Liverpool to Adelaide	-2,336	-10.8	-6.1
Liverpool to Wellington	1,564	6.	3.5
New York to Port Townsend	7,873	32.3	20.
New York to San Francisco	7,873	32.3	20.
New York to Honolulu	6,610	27.0	16.7
New York to Valparaiso	3,747	15.1	9.2
New York to Yokohama	3,768	15.2	9.3
New York to Shanghai	1,876	7.3	4.4
New York to Hong Kong	-18		
New York to Manila	41		
New York to Sydney	3,932	15.8	9.7
New York to Adelaide	1,746	6.7	4.0
New York to Wellington	2,493	9.9	6.0
New Orleans to San Francisco	8,868	36.4	22.6
New Orleans to Yokohama	5,705	23.3	14.4
New Orleans to Valparaiso	4,742	19.2	11.8

To appreciate fully the influence of the canal on rerouting of the world's shipping is a puzzle that requires careful working out. Will a tramp ship, returning to New York or Liverpool from a particular port, say Valparaiso or Sydney or Yokohama, use the Panama Canal? The answer to that question is decided of course by the balance sheet. We can tell pretty well how much time it will save. But what is a ship's time worth? Its value fluctuates. Plainly the use of the canal by tramp steamers will fluctuate.

In all four of the Panama trade zones the Pacific liner is getting an ever greater hold and the liner is rarely interested in getting to any *one* port. She makes a voyage and calls at many ports. The line manager is interested in getting to or from the *end port* of his chain. Thus Callao and Antofagasta and Iquique may be very important to the tramp, but the West Coast liner usually calls at each of these and at many other ports besides. The line manager in this region has two things to do; one is to call *once* at a whole string of ports, and to get his ship full of nitrate of soda so that she is sure to have a cargo. Nitrate is to the West Coast liner something to fill up on, a kind of traffic life preserver. A Liverpool liner to South America usually finds Coronel, the South Chilean coal port (as far

from the equator as New York), the farthest place in which it has interest, and the same vessel may and often does serve the coast to Guayaquil on the equator. The question then resolves itself into getting to or from Guayaquil and Coronel, and Coronel is but 1,089 miles (four days at 10 knots, 2.3 days at 16 knots) farther via Magellan than via Panama. It therefore looks quite feasible for those European vessels to go down through the Canal, deliver their manufacturers, finish their business at Coronel, and come home by Magellan, even though the straits will put up the insurance and may make a delay of a day.

So far as the United States is concerned, the westward jutting continent of South America increases Coronel distances, with savings of 13.2 and 8.1 days for 10- and 16-knot speeds to New York and 17.7 and 10.7 days for similar speeds to New Orleans.

Australasia offers an interesting line situation. The line traffic is in the main a three-port service to Adelaide, Melbourne, and Sydney. From New York to Sydney the saving is nearly 4,000 miles, and when the end port, Adelaide, is reached, the ship is still 1,746 miles nearer home via Panama than by Good Hope. And then there is the coal monopoly of Sydney to serve as a magnet to coal-using vessels.

Those facts seem to incline the New York Australasian trade to the Canal. New Orleans would have greater distance savings but there is small comfort for any canal enthusiast in the distance figures from Britain to Australasia.

If we wish to contemplate the greatest change that the canal will make we must look at the commerce of the Orient and of the Pacific coast of America. We have here a blind alley. The canal will open out the blind end. The trade of China and Japan is peculiarly one-sided from the tonnage standpoint. This has caused one of the most astonishing voyages in the world—the continuance of European liners from Japan to the United States for part cargo and their return to Europe via Japan and China and the Suez Canal with its high tolls. The Panama Canal will be a great gain to the owners of such lines. The blind alley will open. By sending the vessels on to the eastward they will reach Liverpool in about half the time now required to go via the Arabian Sea. One of the most interesting things in all the Panama traffic re-arrangements will be this round the world movement of vessels engaged in the Oriental trade. The table of distances shows that Yokohama is surprisingly near the distance divide from Liverpool by the two canals and it is quite likely that the advantages in favor of Panama will offset that difference. The magnets of American freight and probably also of American coal, will continue to exert their influence and the ships of Europe and eastern America may go around the world one way or the other according to the demands of particular services.

It is thus plain that every one of the great Trunk Routes of the sea will be materially affected in this rearrangement of the world's ocean freight circulation.

SOUTH POLAR EXPLORATION

By C. J. POSEY,

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THE arrival of Captain Roald Amundsen in this country to give his lectures on his trip to the south pole has served to arouse again the interest of Americans in that practically unknown part of the world. There probably has never been a time in geographical exploration when two such difficult feats as reaching the poles have been accomplished in less than a half-decade of each other (April 6, 1909, and December 14, 1911), and when recently in Washington the two discoverers, Amundsen and Peary, clasped hands in mutual congratulations, the event was happily characterized as being historic.

In these later days we have become so used to such trips being made in the interest of science that we are likely to lose sight of what earlier was the impelling force in such expeditions. Modern polar exploration had its inception in the desire for wealth. With their capture of Constantinople in 1453 the Turks, by thus gaining control of the routes, cut off the overland trade that had sprung up between Europe and the Orient. It was on such trade that Genoa, Brindisi, and Venice grew rich and powerful. Even before the complete throttling of this overland commerce attempts were being made to find an all sea route to the riches of India, China, and the Spice Islands, and when later it was found that the route directly west from Europe was closed by the Americas, the explorers began to work to the poleward limits of these continents and to the north of the Eurasian land mass as well. South America was rounded by Magellan in 1519-22; the northeast passage, i. e., to the north of Europe and Asia, was accomplished by Nordenskiold in 1879; and the northwest passage was first made by Amundsen so recently as 1906. Taken as a whole certainly not the smallest result of polar exploration has been the acquiring of wealth, and, contrary to common opinion, the direct and indirect income has very probably exceeded the financial outlay. From 1668 to 1778 the Dutch whale fisheries in polar waters are estimated by Scoresby to have yielded over $100,000,000, and the value of this industry for England, Holland, and America combined is said by Starbuck to total over $680,000,000.

By the beginning of the 16th century the idea had become prevalent among geographers and explorers that there was a vast continent about the south pole, the land to the south of Magellan strait being believed to be a portion of it. In 1642 Tasman showed that there was open sea to the south of Australia and Tasmania; in 1772 Kerguelen proved that there was no continent immediately to the south of Africa; and about the same time Cap-

tain Cook (1772-5) proved that such a continent, if it existed at all, did not extend beyond the Antartic circle. Following Cook's voyages little was done by way of Antarctic exploration for almost fifty years. Then came a period of nearly twenty-five years when interest was intense and rivalry keen. This period was begun by Smith (1819) who discovered the South Shetland Islands. Then two men, Palmer (1821) an American, who discovered Palmer Land, and Bellingshausen (1820-1), a Russian, who got as far south as and named Alexander's Land. The next few years must have yielded many wonderful stories of this land of ice and snow for in 1821 Powell discovered Trinity Land, then came Morrell (1823), Weddell (1823) who got as far as 74° 15′ S. near Long. 33° W., Biscoe (1831-2) who discovered and named Enderby Land the first year and Graham's Land the next, Kemp (1834), Balleny (1839), D'Urville (1839-40), Wilkes (1839-40), Ross (1842) who reached 78° 10′ S. at about 163° W. Long., and Moore (1845). Then follows another period of approximately fifty years when little was done in south polar work. The present period of activity had its inception in 1893-5 when certain Scotch and Norwegian whalers ventured farther south than usual. Then a Belgian equipped ship, the Belgica, was sent out in 1897-8, and the ship becoming fast in the ice and drifting for thirteen months, the party was perforce the first to winter south of the Antarctic circle. In the latter year, 1898, a German steamer, the Valdavia, under Professor Chun rediscovered Bouvet Island, which had not been visited since the time it was first seen by Captain Cook. Presently Germany, Sweden, and Great Britain entered into an international agreement whereby three separate expeditions, one from each nation, were to be despatched to the Antarctic. These were to sail in 1901 and each was to have its distinct sphere of action. The British were to explore the area south of Australia, the Swedes that south of South America, and the Germans had for their first objective the Kerguelen Islands. The German ship was the Gauss, commanded by Drygalski, the Swedes set sail in the Antarctica under Captain Larsen, and the British Discovery was under Captain Scott. It was not the purpose of the expeditions to try to attain the south pole, but the British party succeeded in getting to 82° 17′ S. on December 30, 1902, which was he farthest south attained up to that time. Shackelton, who was invalided home on this trip, later fitted out the Nimrod and set sail for the south in 1908. On January 9, 1909, he reached 88° 23′ S., which is but 111 miles from the pole. Two other noteworthy things were done by this party—the climbing of Mt. Erebus, an active volcano 13,000 feet high, and the location of the south (+) magnetic pole, which was found to be in Lat. 72° 30′ S. and Long. 154° E. Shackelton's record stood for less than three years for Amundsen attained the pole December 14, 1911, and it may be that both the British and Japanese parties now in that region have also succeeded in reaching it.

While the two polar areas resemble each other and differ from all the rest of the world in the severity of their climate and the contrast between winter and summer in the matter of daylight, there are differences between the two which make for relative ease or difficulty in exploring as the case may be. The Arctic ocean is so broken by tongues of land that it has happened that exploring parties after losing their ships have made their way back to civilization, but from Lat. 83° N. the trip must be made over the frozen ocean. The isolation of the Antarctic land mass makes it extremely unlikely that a crew shipwrecked at its margin could ever return by its own exertions. Except along the seashore the Antarctic lands are unlike the Arctic in that there are no large animals. This absence of such animals is in the main to the advantage of the southern explorer for he need not be troubled with the problem of defending himself and he can leave his supplies unprotected in so far as the depredations of animals are concerned. From the explorer's standpoint perhaps the most marked difference between the two regions lies in the season when the "dash" for the pole may be made. Amundsen waited in his winter quarters till he felt sure that winter and the short changeable spring had passed and then set out on his trip with practically four months of summer in which to cover eleven degrees of latitude and return. Peary, on the other hand, found it advisable to make his dash and return before summer had got under way because of the necessity of completing the over-ocean part of his trip before the ice broke up. In all probability a 500 mile trip over ocean ice would offer more obstacles and dangers than a trip of equal length over land ice; and this is not saying that the latter would be at all easy.

Amundsen's lecture on the trip as given in the January, 1913, number of the *Geographical Journal* is most interesting reading. His suppression of the pronoun "I" is indeed refreshing, and one cannot but feel that it was this quality in the man that brought out the loyal support of his comrades. To read his account one feels that the thing was very easily done, but through it all there runs the note of careful planning and preparedness at all stages.

Along the route followed, between the meridians of 163° W. and 170° W. Long., Amundsen found the elevation to be about 150 feet between the parallels 79°-85° S. and from 86° S. to the pole the average elevation was in the neighborhood of 10,000 feet, that at the pole being 10,260 feet. He cites no positive evidence of land till about 85° whereas in Long. 165 E. the land extends outwards to Lat. 70° S.

The meteorlogical data he obtained should prove very valuable. The lowest temperature observed was—74°.2 F. on August 13, 1911, which was but eleven days before the return of the sun. The mean temperature for the year was—14.8 F. The recording of prevailing easterly winds and a generally

low barometer at "Framheim," the winter quarters in Lat. 79° S., is especially interesting as is also his belief that in the vicinity of the pole itself there is every indication of constantly calm weather.

It is hoped that the geological specimens Amundsen's party collected will be complete enough to help solve materially the problem of the conditions obtaining in that part of the world in former geological ages.

THE LANGUAGE OF GEOGRAPHY

By EUGENE VAN CLEEF,

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GEOGRAPHY as taught in the schools today may be classified under two heads namely, Geography of Fact and Geography of Interest. The first kind of Geography is characterized by the old-fashioned "grind"; the second kind by the new-fashioned "lack of effort". The relative efficiency of these two classes and the desirability of either one presents a problem.

In the early days of geography teaching, and that was not many years ago, locational or place geography constituted the larger part of the outline of the course of study. As long as cities, mountains or lakes were located the subject was termed "dry" and was one of the most detested in the school course. Map drawing was an important feature of the work. That sort of work consumed much time and the boys and girls considered it drudgery.

Many educators believed there was something wrong in the method of teaching. The text-books were criticised and new ones were written. What was the difficulty? The answer to this question was the same as that for all the other subjects of the curriculum, namely, not enough interest aroused in the students. The matter ought to be presented in a more vivid and perhaps dramatic or startling style. For example, instead of locating Chicago on Lake Michigan in northeastern Illinois, it ought to be located with reference to its environment, exactness in location being secondary. In the study of products, corn for example, samples should be brought into the room; its by-products discussed; attention called to its importance as food. In other words the principle of presenting geographic facts through the medium of causal or relational factors was thought to afford a means for introducing life into the subject and preventing its decay.

But even these suggestions, good as they seemed to be, did not solve the problem. Some one said that to teach about things far from home was illogical. Teach the boys and girls the geography of their home. Then conditions abroad can be more intelligently interpreted and will

make a more satisfactory impression upon the youthful mind. Hence Home Geography found its way into the schools and that became the fad and more text-books were written.

Yet with all of this improvement in method the geographical information possessed by our students is pitiably bad. Teachers the country over, in Grade School, in High School, in College, in Normal School and in University have had their meetings to discuss the organization of material. They have suggested rearrangement, omissions and substitutions. However, judging from observations made in many of these schools during the past 3 years in the territory north of the Ohio River and east of the Missouri River, the improvement if there be any is essentially unnoticeable. The reason often assigned for the present condition is inefficient teaching. While this is very largely true yet in courses such as arithmetic, grammar and history there undoubtedly is inefficient teaching but results seem to be better.

A criticism of the present situation and a partial solution is offered. In the effort to make interesting the discussion of location of cities, states, or lakes, or the description of surface conditions, climate or commerce, fundamental facts have slipped away. Relational or causal geography has maintained the interest of the child but the facts have got away. There is a tremendous difference between listening to or reading interesting statements and absorbing significant facts. One may discuss the industries of Pittsburg, the whys of their concentration at this point; but fail to be impressed with Pittsburg's location in Pennsylvania and in the United States; fail to realize its population; its distance from important trade centers; topographic conditions of its environment and many other concrete facts.

Further, the extreme effort to present matter in an interesting, appealing manner has virtually lead the teacher to fear lest the student work too hard.

The up-building of the interesting phases has been the razing of the informational phases. If subject matter is presented so that students will necessarily think rather than merely "drink in"; if students will have to solve problems rather than have the solutions served "on a silver platter" all nicely arranged, they will not object to work. Even though they do wriggle under the pressure of work once in awhile because the work is not to their particular liking, teachers should not hesitate. There are many things in life that one does not always like to do but must. Therefore it is well that the child experience this situation at times as preliminary training for the real world. Work stimulates brain activity; unless unusually feeble such activity will benefit everyone. Our educational system breaks down today not so much because it lacks practical subjects but because the

curriculum is too easy and the students are not taught *how to work and think*. Geography offers a wonderfully fine opportunity for the building up of thinking young men and women.

But now to be somewhat more specific a suggestion that seems to offer a partial solution follows. There is a language in geography as there is in arithmetic or history or grammar or nature study. Specialists in geography for the most part have not insisted upon the use of this language; therefore teachers can not be entirely blamed for not using it. The writer has observed during the past year that high-school graduates and students just out of the grades are not troubled so much with getting an understanding of geography as they are with expressing themselves. They can not say what they wish to say in definite terms that will present a clear unquestionable demonstration to their fellow students. The following are a few expressions used by the students and paralleling them are the equivalents in what may be termed the language of the subject:

1

STUDENT LANGUAGE	GEOGRAPHIC LANGUAGE
The path in which the earth moves around the sun.	The earth's orbit.

2

It isn't very wet there.	The rainfall is low

3

The winds blow in toward a center from all directions and against the hands of a clock.	The winds blow spirally inward anti-clockwise.

3

Pittsburg is where the Allegheny and Monongahela rivers come together in Pennsylvania.	Pittsburg is located in southwestern Pennsylvania at the junction of the Allegheny and Monongahela rivers.

5

The soil is good for growing things.	The soil is fertile.

6

Milwaukee is in Wisconsin on the shore of Lake Michigan where the Milwaukee river empties into the lake.	Milwaukee is in southeastern Wisconsin on the shore of Lake Michigan and at the mouth of the Milwaukee river.

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5	The soil is good for growing things.	The soil is fertile.
6	Milwaukee is in Wisconsin on the shore of Lake Michigan where the Milwaukee river empties into the lake.	Milwaukee is in southeastern Wisconsin on the shore of Lake Michigan and at the mouth of the Milwaukee river.

7

The climate of Florida is warm	The temperatures in Florida are high.

8

The height of Duluth above the level of the sea is from 602 feet up to 1360 feet.	The altitude of Duluth ranges from 602 feet to 1360 feet.

9

The soil comes from some other region.	The soil is transported.

10

New York City is ahead of the other cities on the Atlantic coast because it can get to the country back of it easier than the other cities.	New York City leads all other cities on the Atlantic Coast because of its easy communication with its hinterland.

The above illustrations will serve to indicate the possibilities of making geographic statements more definite and thereby insuring, more so than now, the ease of retention of information. Instead of endeavoring to interest primarily; instead of re-organizing the materials as a whole, let the teachers of the country insist upon exactness of statements involving the use of the language of geography where there is such language to be used. The student of arithmetic is not taught to say "if you take a number 4 and place 2 under it you will get 2 as a result" but rather "4 divided by 2 equals 2." He is taught definite expressions which he not only uses in the class room but uses for all times to come wherever he may be. He is never misunderstood if he employs these expressions. Why can not the geography student be taught the use of definite terms and the subject thereby given stability instead of permitting it to be relegated to an indefinite conglomeration of statements without the respect of the people of the world. The subject of geography is of practical value to every individual and therefore demands development along lines of precision.

COMMERCIAL GEOGRAPHY OF EUROPE

Miscellaneous Review Questions

1. Account for the smallness of Spain's foreign trade; of Turkey's.

2. Name the chief geographic factors that promote the foreign trade of the United Kingdom; France; Germany; the Netherlands.

3. What European countries are increasing their foreign trade with marked rapidity? With medium rapidity? Slowly? Why?

4. In what European countries is agriculture the dominant industry? Why?

5. Compare and contrast agricultural conditions in the United Kingdom, France, and Russia.

6. In what parts of Europe is wheat a main crop? Rye? Potatoes? Sugar beets? Corn? Grapes? Flax? Olives? Account for the fact in each instance.

7. What countries have coal in large quantities? What ones find it necessary to import it? What countries export it in considerable quantities? To how great a degree do the native coal supplies of a country determine the extent of its manufacturing?

8. What rivers of Europe are important highways of commerce? Locate them. Compare them with respect to utility for commercial purposes.

9. Account for the dry summer climate of the Mediterranean countries. What are some of the chief effects?

10. Arrange the following cities in order of latitude, the most northerly first: Berlin, Madrid, St. Petersburg, Paris, Rome, London, Constantinople, Chicago.

11. Select the five European countries which you consider to have the most advantageous position for foreign trade. In what order would you rank them in this particular?

12. What European countries would suffer most if all trade with other countries were cut off? What ones would suffer least? Give your reasons in each case.

13. What ten cities would you name as the most important ports of Europe? Locate these cities and show wherein *natural* advantages have favored them.

14. Nearly every country has some serious handicaps, tending to retard its commercial growth. Point out these handicaps in the case of each of the five or six leading European countries.

15. Nearly every European country has gained a world-wide reputation for the manufacture of some particular article or articles. Name some of these articles in the case of the more important countries. Can you assign reasons?

16. What parts of Europe have an exceptionally dense population? Can you point out the reasons?

17. In what particulars do the Russian and British Empires present the strongest contrasts?

18. Contrast Austria and Hungary in their industrial activities.

Holland and Belgium; Norway and Sweden; England and Germany; France and Spain.

19. What are the chief (five) commodities which we sell to Europe? What countries are the largest purchasers of these? Why?

20. From what European countries do we buy extensively? What do we buy most largely? Why do we not produce these things?

21. What European countries would suffer seriously if they were quickly cut off from all trade with the United States? Explain how and why.

22. Are we chiefly dependent upon Europe for markets for our products or for imports which we actually need? Explain.

23. Point out some of the apparent relationships between popular education and industrial progress in European countries.

24. What European countries have high protective tariffs? Low tariffs or none?

25. What countries of Europe would you name as being richly endowed by nature, and what ones as being handicapped by nature, but effectively developed by man's efforts? In what ones has man conspicuously failed to do his part? In what ones have man and nature co-operated most effectively? R. H. W.

MISCELLANEOUS QUESTIONS OF THE TYPE REQUIRING JUDGMENT RATHER THAN MEMORY

1. Compare the chief lines of industry in Holland with the chief lines in Belgium, and account for the difference.

2. Compare the geographical situation of France with that of Germany, and try to decide which is the more favorably situated for foreign trade.

3. England is the leading European nation in the manufacture of one textile, and France in the manufacture of another. Point out the difference and account for it.

4. What are the leading occupations of the people of Norway? To what extent are these occupations forced upon the people by their geographic environment.

5. What classes of commodities constitute the bulk of our exports to the United Kingdom? What are the reasons for this?

6. Contrast the general character of our exports to Argentina with that of our exports to Germany, and account for the difference.

7. If trade between the United States and the United Kingdom were entirely cut off for a period of years, which country would suffer more? Why do you think so? What industries in the United States would suffer severely? In the United Kingdom?

8. Where in the United States are iron ore smelters and steel-making plants chiefly located? Account for this.

9. In spite of a preferential tariff, which favors the United Kingdom, we sell more to Canada than does the mother country. How do you account for it? Do you see any principle illustrated by this?

10. How do you account for the fact that Holland's foreign trade exceeds that of Russia?

RECENT PUBLICATIONS

THE BRITISH EMPIRE. By A. J. Herbertson and R. L. Thompson. The Oxford Geographies series. Clarendon Press, London, 1912. 253 pages, 5x7½ in. 112 figures and two colored maps.

The book is made up of seven parts, 23 chapters. Nearly one-half of the space is devoted to the British Isles. British North America receives 25 pages. Aside from two tinted physical maps, the only illustrations are sketch maps of the sort commonly found in English Geographies. For actual teaching value they may serve as well as, or even better than, our more carefully executed and more elaborate maps, but they seem a little crude to us. We also miss the half-tone illustrations which adorn the American text-books. Possibly American publishers are over-adorning our geographies, but it certainly seems that English publishers would add to the attractiveness and usefulness of their books if half-tones were employed more than they are. On the other hand, half-tones require the use of glossy paper which is more trying to the eyes of the reader.

The very fact that Professor Herbertson is one of the authors, is a guarantee of scholarship and sound pedagogy. Emphasis is placed almost equally upon the natural features and the human geography of the different parts of the empire. The language is very clear and simple. The style is not uninteresting, nor can it be made highly interesting without less compressing than the authors have felt called upon to accomplish. The strong feature of the book is the natural but masterly way in which man's activities are shown to grow out of his physical environment.

COMMERCIAL VALUES. By Mark Jefferson. An Atlas of Raw Materials of Commerce and Commercial Exchanges. Ginn and Co. 64 pp., Paper. 25 cents.

A book of exercises to facilitate the study and teaching of Commercial Geography. Twenty-two carefully prepared maps show the regions of production of each of the important commercial products. The symbols employed indicate quantity produced annually as well as region of production. Eight other maps present various facts of Commercial Geography. Questions accompany each map. The Atlas is painstakingly prepared and we may be sure that Professor Jefferson has spared no effort necessary to insure accuracy. The Atlas may be used in connection with any text-book

of commercial geography, and it ought to be a genuine help to teachers in effectively teaching the subject.

THE EARLY SEA-PEOPLE. By Katharine E. Dopp. Published by Rand, McNally and Co., 1912. 224 pages. 50 cents.

This is the fourth volume of Katharine E. Dopp's series of readers on social and industrial history, based on sound information which has been utilized with great care. Miss Dopp has set herself no easy task in bringing the great facts of the beginnings of society within the grasp of the child.

The story of the sea-people follows logically the narrative of the cave men and traces a further step in the progress of the human race. The settlement on the seaboard of a wandering tribe of the Stone Age, the familiarity they gradually form with their new surroundings, the progress they make through inventions, which are impelled by necessity, and their final development from fishermen along the coast to sea farers—these are the stages of growth on which the stories rest. In such a simple statement of the evolution of society lies one of the best methods of introducing the child to the intelligent study of history.

At the end of each story is a short list of "Things to Do" in review of what has gone before; and a group of "Things to Think About" in preparation for the following chapter. Thus the book is as well prepared to serve the serious purposes of the schoolroom as it is to hold attention through its dramatic story element.

THE Association of American Geographers held its ninth annual meeting at New Haven, Connecticut, December 27-28, 1912. The sessions were held in Lampson Hall, Yale University, and an informal meeting took place Friday evening at the Graduates' Club. In the absence of the president (Professor Salisbury), Mr. M. R. Campbell, the first vice-president, presided. About thirty members attended.

It is gratifying to the members to see the increasing number of papers on anthropogeography, regional geography, and climatology that deal with human relations, a feature less prominent in the earlier programs of the Association. Seven purely physiographic papers were presented out of a total of sixteen. Great interest is manifested in the Annals of the Association since the appearance of the first volume during the past year. The publication committee has performed a distinct service to geographic science in securing papers of high quality and a volume of excellent appearance.

The newly-elected officers for 1913, are as follows: President, Henry G. Bryant; First Vice-President, Ellsworth Huntington; Second Vice-President, Charles C. Adams; Secretary, A. P. Brigham; Treasurer, F. E. Matthes; Councillor for three years, R. DeC. Ward. The publication committee appointed for two years (1913 and 1914) consists of R. E. Dodge, Editor, and Alfred H. Brooks, H. E. Gregory, and H. H. Barrows.

ISAIAH BOWMAN, Acting Secretary.